I. C. 6491

SEPTEMBER, 1931

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
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TURQUOISE

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I. AITKENS

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September, 1931.

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DEPARTMENT OF COMMERCE - BUREAU OF MINES

TURQUOISE[1]

By I. Aitkens[2]

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INTRODUCTION

Turquoise is prized solely for its attractive color; it is dull and opaque, wholly lacking the brilliant luster that is the chief attraction of transparent gems. The best quality of turquoise is blue, of a soft and pleasing tone, like the color of clear sky but distinctive, as indicated by use of the term "turquoise blue." Often its value is lessened by a greenish cast; in many stones the green predominates. A large proportion of the turquoise that is mined is utterly worthless, so inferior and unattractive is its color.

The finest grade of turquoise comes from Persia, notable from Nishapur. Large quantities have been mined in the Southwestern States of the United States, and less important deposits have been found in a number of the other States.

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[1] The Bureau of Mines will welcome reprinting of this article, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6491."

[2] Rare metals and nonmetals division, U. S. Bureau of Mines.

DESCRIPTION AND PROPERTIES

Turquoise is opaque in the mass, but a very thin piece is translucent to semitranslucent. Although a polished surface will have a slightly vitreous cast, the luster of a fresh break is waxlike and dull. Its fracture is slightly conchoidal to uneven. Massive varieties show no cleavage. It is rather brittle and resembles ivory in consistency.

Turquoise has approximately the same hardness as feldspar and is distinctly softer than quartz. It will scratch window glass and is itself scratched, though with difficulty, by a knife blade of good quality. The hardness, however, is not absolutely uniform. Some vein turquoise is slightly above 6 in hardness (on Moh's scale), and the average cut stone is perhaps a trifle under 6. Hardness of course is a very desirable quality. In comparison with other gem stones it is soft and is readily marred by rough usage.

The specific gravity is usually described as 2.60 to 2.83, although some writers have noted it as 2.4 or less.

Turquoise ranges in color from sky blue to pale green. The pure blue, called in trade "sky blue" or "robin's-egg blue," is the most favored tint. Comparatively few stones are entirely free from a green element, and with increasing greenness the value lessens.

According to Dana, turquoise is essentially a hydrous phosphate of aluminum colored by small amounts of a copper phosphate, $H(Al.2OH)_2PO_4$, with isomorphous $H(Cu.OH)_2PO_4$. In addition to the copper the turquoise molecule iron is always present as an impurity and exerts a modifying influence upon the shade. Some turquoise fades to an unsightly grayish or greenish cast; but, in general, a stone that holds its color for a reasonable period is very likely to retain it permanently if treated carefully.

Turquoise is sometimes termed callaite by mineralogists, since it is believed to be the callais of Pliny. The name callainite was suggested by J. D. Dana for a bright green mineral which was found wrought into beads in ancient graves. This mineral seems to be identical with variscite.

Much of the material that is unfitted for pure gems is cut into matrix with attached country rock, quartz, limonite, and other impurities; and although it yields very attractive patterns and contrasts, it never commands the price of pure turquoise.[3] In recent years, however, an increasing demand for turquoise matrix has been evident.

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[3] Pogue, J. E., The Turquoise; a Study of Its Histroy, Mineralogy, Geology, Ethnology, Archeology, Mythology, Folklore, and Technology: National Acad. Sci., 3d Mem., vol. 12, pt. 2, 1915, p. 131.

Odontolite

Bone or fossil turquoise, which is also called odontolite, is not a variety of true turquoise. It consists of fossil bones or teeth, colored blue by vivianite, a hydrated iron phosphate. Odontolite is seldom seen nowadays and has slight value.

USES

The uses of turquoise in ornamentation are many and varied. Strings of bright stones found in the beds of streams probably formed the earliest jewelry of primitive man; an abundance of turquoise is found in ancient graves. In Central America and Mexico, and also in southwestern United States, the Indians employ turquoise for both ornamental and religious purposes. In Turkestan earrings, belt ornaments, brooches, pendants, rings, dagger handles, horse trappings, and other objects are decorated with turquoise inlays.

The inhabitants of Tibet have used turquoise since the eighth century. Immense quantities of coral and turquoise are worn by both men and women. According to Berthold Laufer,[4] who has made a detailed study of turquoise in Tibet, turquoise has a religious significance to these peoples of the East, as it has to certain tribes of American Indians. Their temples and images are extensively decorated with it, and it is used upon the charm boxes which most Tibetans carry suspended from their necks. Many objects of utility are also enriched by decorations of turquoise and coral. Turquoise will even pass for money, and travelers going to Tibet from China often carry supplies of turquoise beads. The women wear great quantities of turquoise-decorated ornaments in their elaborately dressed hair.

Turquoise was used extensively in ancient mosaics. According to Pogue,[5] one of the most interesting and highly developed arts in prehistoric America was that of incrusting objects for ceremonial and ornamental purposes with precious and semiprecious stones.

This form of art reached its highest development in ancient Mexico and Central America; but excellent examples have come from ruins in the southwestern portion of the United States, and objects from Peru inlaid with turquoise indicate a similar application in South America.

Ancient mosaics showing great skill in workmanship and taste in design are to be seen in the leading museums. Only twenty-four examples from Mexico and Central America are now known. Twenty-three of these are to be found in European museums. Most of them reached the continent during Spanish occupation of this region. The best preserved are very beautiful.

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[4] Laufer, Berthold, Notes on Turquoise in the East: Field Mus. Nat. Hist., Pub. 169, Anthro. ser., vol. 13, No. 1, 1913, pp. 5-20.

[5] Pogue, J. E., Work cited, pp. 93-97.

SUBSTITUTES

Quantities of blue imitation stones are used in most cheap jewelry. Turquoise has been imitated from the earliest times. Even the ancient Egyptians had a blue enamel which they called mafkat (turquoise). There are now three kinds of imitations, which may be classed as follows:

1. Blue glass or enamel.
2. Artificial compounds (closely approximating turquoise in composition).
3. Other minerals (either naturally resembling turquoise or made to do so by stains and dyes).

Blue glass (paste) or enamel imitations are the most common, but they are very crude and look glassy. By far the best counterfeit is obtained by mixing precipitated hydrated phosphate of aluminum with copper phosphate and subjecting the mixture to hydraulic pressure while damp. This product, in reality a synthetic turquoise, often can not be positively distinguished from the natural mineral, except by heating a small fragment.

When heated in a blazing flame, an artificial stone or glass imitation will fuse quietly and readily to a black or dark-colored slag, whereas the genuine article will either fly to pieces or crumble with a crackling sound into a dark-colored earthy mass or powder.

Some artificial stones assume a darker shade of blue after lying in water and disclose a network of cracks upon the wet surface. Moreover, such stones become somewhat softer after immersion in alcohol. Turquoises so fabricated have been placed upon the market in considerable number, particularly in Europe.

Cheaper minerals are occasionally substituted for turquoise. These minerals may be colored naturally or artificially to duplicate the desired shade. Odontolite (or bone turquoise), lazulite, blue chrysocolla, copper-stained chalcedony (or blue chrysoprase), artificially stained chalcedony, and in rare instances, azurite, are employed thus. If green turquoise was highly prized it also would be open to substitution by variscite, malachite, chrysocolla, and green chalcedony.

HISTORY

Turquoise, mined on the Sinai Peninsula, was used as an ornament by the Egyptians even before the first synasty (about 5500 B.C.). Turquoise beads are found in prehistoric graves antedating the dynasty period. Ancient records show that mining operations were continued in the Sinai Peninsula until the close of the twentieth dynasty (about 1100 B.C.). The name, turquoise, indicates that the early European supply, though doubtless originating in Persia, came by way of Turkey.

OCCURRENCE

Turquoise is formed most commonly as a deposit from surface waters that have percolated through rocks containing apatite and disseminated copper minerals. It occurs typically as amorphous veins or crusts and as rounded masses, disseminated grains, or rounded pebbles. With the exception of one occurrence in Virginia, it has never been found in crystals.

Pogue[6] distinguishes the following three modes of occurrence:

Type 1.- The turquoise occurs in acid igneous rocks rich in alkalic feldspars and considerably altered by weathering or deep-seated alteration, or both. The majority of commercially important deposits come under this head; as for example, the Nishapur deposits, and the principal deposits of the West; particularly those of the Burro Mountains and the Cerillos Hills (New Mexico).

Type 2.- The turquoise occurs in sedimentary or metamorphic rocks near the contact with igneous masses, and is apparently connected in genesis therewith. The mines in the Mohave Desert, California, and several in the Esmeralda-Nye County regions of Nevada, most notably the Smith Black Matrix mine, offer examples of this type of deposit.

Type 3.- The turquoise is present in a nonigneous matrix (usually sandstone or shale) and has no apparent genetic connection with any igneous body. The Sinai and Australian occurrences are the principal representatives of this type. The occurrences in Alabama and Virginia appear to form further examples, but their geology is not sufficiently known to accept this with confidence.

Significant data connected with the occurrence of turquoise throughout the world are given in the following table. Occurrences of which the geological relations are doubtful are omitted.

Table 1.- Geologic association of principal occurrences[7]

Locality	Containing rock	Associated minerals	Remarks
Abyssinia	Ferruginous sandstone, intruded by porphyry and capped by basalt.	- -	- -
Sinai Peninsula	Ferruginous sandstone, capped by basalt.	Limonite	- -

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[6] Pogue, J. E., Work cited, p. 63.

[7] Mainly from Pogue, J. E., Work cited, p. 60.

Table 1 - Continued

Locality	Containing rock	Associated minerals	Remarks
Persia, Nishapur	Altered trachyte and trachytic breccia	Limonite and kaolin	Trachyte contains apatite. Turquoise replaces feldspar crystals.
Turkestan, Mt. Karamazar	Altered feldspatic porphyry, and in veins of ferruginous quartz	- -	- -
New South Wales, Bodalla	Carbonaceous shale	Pyrite	- -
Victoria, King River	Carbonaceous slate	Limonite	- -
Alabama, Clay County	Graphitic schist	- -	- -
Arizona, Mineral Park	Altered quartz porphyry and granite porphyry	Limonite, kaolin, alum, copper sulphate	Kaolinization, sericitization, and silicification reported
California, Fresno County	Granite,	- -	Pseudomorph after apatite
Manvel district	Altered granite porphyry	Limonite, kaolin, sericite, jarosite, quartz	- -
Mohave Desert	Altered rhyolite and biotite gneiss, along contact	Limonite and quartz	Rhyolite in part a sericite schist; considerably kaolinized.
Colorado, Lajara	Altered trachyte	Limonite, kaolin, sericite	- -
Nevada, Esmeralda-Nye County region, New Royal Blue mine	do	Limonite, kaolin, sericite, quartz	- -
Same. Wm. Petrey mine	Altered rhyolite	Limonite and kaolin	Rhyolite contains casts of apatite crystals.

Table 1 - Continued

Locality	Containing rock	Associated minerals	Remarks
Nevada, Esmeralda-Nye County region, Myers & Bona mine	Altered quartz porphyry and altered black slate, along contact	Limonite	Porphyry contains much sericite
Same. Montezuma mine	Altered trachyte	do	- -
Same. Moqui-Aztec mine	Altered quartz porphyry and included quartz masses	Kaolin, limonite, and quartz	- -
Same. Smith Black Matrix mine	Black, siliceous jasperoid, near contact with rhyolite flow now eroded away	Limonite	Turquoise fills fractures and breccia spaces. Few copper stains in jasperoid.
Same. Near Columbus	Rhyolite; also in silicified sedimentary rock (jasperoid)	Not stated	- -
Lyon County	Altered monzonite	Kaolin, limonite sericite.	- -
New Mexico, Cerrillos Hills	Altered monzonite porphyry (or augite andesite)	Fluorite (?), kaolin, limonite, and quartz	Porphyry contains both sericite and kaolin; also pyrite and apatite.
Burro Mountains, Azure mine	Altered granite; in places along contact with quartz monzonite porphyry	Halloysite, kaolin, jarosite, sericite	Deposited in pronounced fracture zone. Fluorite vein near. Granite contains apatite. Region of copper veins.
Hachita district	Altered trachyte	- -	- -
Same. Robinson & Poterfield mine	Altered trachyte and monzonite porphyry, along contact	Kaolin, limonite, gypsum	Part of trachyte contains much pyrite

Table 1 - Continued

Locality	Containing rock	Associated minerals	Remarks
New Mexico, Jarilla Hills	Altered trachyte	At surface, limonite and kaolin; 70 ft. from surface, pyrite chalcopyrite, jarosite, kaolin	- -
Virginia, Campbell County	Quartz	- -	- -

(The term "altered" is used to include weathering and deep-seated alteration.)

MINING AND PREPARATION

Turquoise has never been found in quantity at depths exceeding 100 feet, and the deposits are confined mostly to arid or desert regions. Usuall the mineral shows up upon the surface, and good material is often found at a depth of a few feet.

At present material is obtained by blasting, but before the advent of gunpowder turquoise was mined by crude tools. An open-cut trench or shallow pit suffices for working on a small scale; but for more extensive operations a shaft is usually sunk, and tunnels are extended horizontally therefrom at certain intervals following the vein.

Due to the isolated and barren regions in which many deposits occur and to the temporary nature of most enterprises, there is no occasion to empl extensive equipment or systematic methods of exploitation. After the rock has been loosened it is broken by hammers and raised to the surface in buckets hoisted by rope and windlass. Additional crushing is then done, and it is hand-picked for rejection of all unsuitable material.

CUTTING

As turquoise is comparatively soft, it is easily worked, but cutting and polishing are rarely done at the mine. The rough pieces or nodules are selected carefully and then shipped, usually to some trade center where the work is done by lapidaries. The most characteristic cut is the "cabochon," which consists of a flat bottom and polished convex top. However, it is cut into a variety of fancy forms and surfaces and is also carved into shapes imitating very elaborate designs. It is never faceted, as are transparent stones.

The lapidary work in the United States was described over 30 years ago by Claremont,[8] whose description has been collated by Pogue.[9]

> A suitable piece is either selected or sawn from a large mass by means of a revolving metal disk dressed with carborundum or emery powder, and is cemented to the end of a slender wooden or ivory holder about the size of a pencil. The latter is held in the right hand of the operator and pressed against a rapidly revolving wheel or lap of lead or tin, upon which emery powder or carborundum is spread. The abrading material works its way into the metal surface which then "bites" the turquoise as a file does steel. The wheel is adjustable to a lathe head and is rotated by foot power or small motor. The turquoise is constantly moved in position, especially as the work nears completion, so as to give the desired shape to the specimen. This operation completed, the cutting wheel is replaced by one of wood, flannel, leather, or silk, against which the gem receives its final finish and polish. Stones are bored by means of a rapidly rotating diamond-tipped drill or a steel drill, dressed with an abrasive.

In Idar, Germany, turquoise is cut on large sandstone wheels, rapidly rotating in a vertical plane by water or steam power.

DOMESTIC PRODUCTION

In the United States recent production of turquoise has been very irregular. For a time turquoise matrix was in very great demand, but the large quantities mined resulted in overproduction. Because of this and because turquoise is temporarily out of vogue many mines are closed.

Production figures are available for 1883 to 1921, inclusive. Later statistics are not available, as the canvass of producers of precious and semiprecious stones was discontinued by the United States Geological Survey in 1922 and has not been resumed by the Bureau of Mines or other agency.

Table 2.- Value of production of turquoise in the United States, 1883-1921

Year	Value	Year	Value	Year	Value
1883	$ 2,000	1896	$40,000	1909	$179,273
1884	2,000	1897	55,000	1910	85,900
1885	3,500	1898	50,000	1911	44,751
1886	3,000	1899	72,000	1912	10,140
1887	2,500	1900	82,000	1913	8,075
1888	3,000	1901	118,000	1914	13,370
1889	23,675	1902	130,000	1915	11,691
1890	28,675	1903	110,000	1916	21,811
1891	150,000	1904	100,000	1917	14,171
1892	175,000	1905	65,000	1918	20,667
1893	143,146	1906	22,250	1919	22,750
1894	34,000	1907	23,840	1920	16,865
1895	50,000	1908	147,950	1921	6,272

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[8] Claremont, L., The cutting and polishing of precious stones: Mineral Ind., for 1899, vol. 8, pp. 229-233.

[9] Pogue, J. E., Work cited, p. 130.

Original from THE OHIO STATE UNIVERSITY

The oldest and largest domestic source of turquoise has been New Mexico, but other deposits of commercial importance also occur in Arizona, California, Colorado, and Nevada. This mineral is likewise found in Alabama, Texas and Virginia and has been reported from New Jersey. It is believed that certain Indian tribes of the Southwest still obtain stones from localities known only to themselves.

Alabama

Turquoise was discovered in 1902, near Idaho, Clay County, Ala., in the neighborhood of former copper mines. It also was found in a railroad cut near Erin, Ala.

All the material found was taken from the surface and is light green to yellowish green. It is thought that low-grade gem material might be found at greater depth. Here there are no traces of aboriginal workings; and no turquoises have been found in Indian graves, as in the western occurrences.

Arizona

Occurrences in Arizona are near Tombstone, Cochise County; Mineral Park, Mohave County; and Pierce, Maricopa County. The most important lie east and south of Mineral Park in Mohave County. Those in Cochise County have never been of very great importance, although this district is known to have produced some fair-quality stones a few years prior to 1909. (For brief geological description of turquoise in Cochise County, Arizona, see U. S. Geol. Survey Bull. 530, 1911, p. 134)

California

At several places in the northeastern part of San Bernardino County, and in Fresno County, turquoise occurs. In the former it has been mined in the Manvel district and further south in the Mohave desert. The Manvel district is a barren region near the Nevada line. These are probably the principal deposits of the state. The principal ones of the Mohave Desert are about 2 miles west of Cottonwood Siding, on the Santa Fe Railroad.

Colorado

Near Lajara, Conejos County, in the south-central part of Colorado, is the principal deposit of the State. It is also reported to occur at Villagrove, Saguache County, about 25 miles south of Salida; and in the Holy Cross district, 30 miles from Leadville. According to the Denver Mining Record of April 20, 1929, a great turquoise strike was made in the San Luis Valley during the summer of 1928.

Original from THE OHIO STATE UNIVERSITY

Nevada

In Nevada the principal deposits of turquoise are in Esmeralda and Nye Counties. Lincoln and Lyon Counties have occurrences of lesser importance.

The Nevada Mining Press of August 30, 1929, stated that turquoise was being mined by the Hudson Mining & Milling Co. at Royston, near Topanah, the first ever mined on the Hudson property. The Salt Lake Mining Review, under date of October 30, 1929, stated that a company capitalized for $100,000 had organized to develop the Hudson property at Royston and announced a plan to restrict shipments for the present to fine royal-blue gems, but eventually to work up a market for low-grade material. Inferior and off-color material will be used for turquoise terrazzo for decorative tiling, and eventually this company expects to build up a new industry to supplement the mining of turquoise for jewelers' use alone.

New Jersey

Turquoise was reported to have been found in 1904, in the workings of the American Copper Mining Co., on Watchung Mountain, at Somerville, N.J.

New Mexico

A greater quantity of turquoise has been produced in New Mexico than any other State, and the stones are noted for their quality. The output has come principally from four regions - the Cerrillos Hills or Santa Fe County; the Burro Mountains and the Little Hachita Mountains of Grant County; and the Jarilla Hills of Otero County. The Cerillos and Burro Mountains are perhaps the best-known districts, although the Hachita came into great prominence at one time.

Texas

In 1884 turquoise was reported to have been found north of El Paso. It has been mined intermittently in Culberson County, Tex., about 5 miles west of Van Horn, by the Texas Turquoise Co. of El Paso.

Virginia

Bright-blue crystallized turquoise was collected by J. H. Watkins from a copper prospect near Lynch Station, Campbell County, in 1911 and was the first recorded occurrence of this mineral in a crystallized form. The following notes on crystallized turquoise from Virginia are abstracted from a description by Waldemar T. Schaller of the United States Geological Survey, Bulletin 509, 1912, pp. 42-47.

A specimen of well-crystallized turquoise from Campbell County, Virginia, was sent to this office for identification by Mr. J. H. Watkins. The matrix of the specimen consists of irregular fragments of glassy quartz which are in part cemented together by thin veins of turquoise. On one side of the specimen the turquoise forms a drusy, botryoidal layer, cavernous in texture and including many small irregular fragments of the glassy quartz. The turquoise, with its many included quartz fragments, polishes well and makes a very handsome ornamental stone. The botryoidal coating consists of minute crystals, rhombic in shape but triclinic in symmetry, analagous to the crystals of chalcosiderite, with which turquoise is shown to be isomorphous. The analysis of the mineral, shown below, leads to the formula $CuO.3Al_2O_3.2P_2O_5.9H_2O$.

Analysis of turquoise specimen
of Campbell County, Virginia

P_2O_5	34.13
Al_2O_3	36.50
Fe_2O_3	.21
CuO	9.00
H_2O	20.12
Total	99.96

(Other analyses of the turquoise yield formulas which are in close agreement with the one given above.)

INDUSTRY IN FOREIGN COUNTRIES

According to Pogue, it is impossible to speak other than in generalities in discussing production of the turquoise deposits of the world. Important productive deposits have been found only in the Sinai Peninsula, Persia (Nishapur), Tibet, China, and the southwestern portion of the United States. However, the mineral also occurs in Abyssinia, Nubia, Turkestan (Bokhara), Afghanistan, Arabia, France, Germany, Spain, Hungary, Siberia, Mexico, Australia, and several South American countries.

Persia

Before the World War mining of turquoise was a leading industry in Persia, incidentally providing the government with a revenue which amounted to $25,000 annually. Since Austria and Russia no longer form a market for this mineral, production and exploration have dwindled to relatively small proportions.

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The famous turquoise mines of Persia near Nishapur supplied nearly all the turquoise used in Europe and western Asia for 800 years or more; and until a little over two decades ago the American trade also. It is impossible to approximate even vaguely the total production of these mines, as there are no records prior to the latter part of the nineteenth century; and it is not known when these mines were first operated.

Turquoise occurs at several other localities in Persia, but none have been important producers.

Egypt

The oldest turquoise mines in the world are situated in the Sinai Peninsula. As early as the first dynasty (about 3200 B.C.), the kings of Egypt sent expeditions of miners to Sinai. According to Ball,[10] these royal mining expeditions were highly organized, often comprising 2000 or 3000 laborers with a military escort. A campaign was generally begun in November and concluded by May, before the summer heat became excessive; but, in at least one instance three years elapsed before the adventurers returned to Egypt. The mines were worked in this manner over a period of some 2000 years, until late in the twentieth dynasty (about 1100 B.C.). The quantity of turquoise obtained was never very great, although in one year over 400 kg. (882 pounds) were produced. Malachite was a by-product, and the miners usually brought back manganese and copper ores for use chiefly in glazes and enamels.

In the nineteenth century, about 1845, the old mines at Wadi Maghara were rediscovered and according to Ball (work cited, p. 485) were worked on an extensive scale by Maj. C. K. McDonald from about 1854 until 1866, when operations were transferred to Serabit and then discontinued because the stones soon lost their color. Somewhat later a Frenchman worked the mines for a short period, and in 1903 English promoters obtained a concession. This last attempt, however, was a complete failure; work was abandoned after a year or two. Even now, occasional stones are picked up in this region by the Bedouins, who barter them off in exchange for articles they need; but according to Davey[11] all known areas in Sinai are completely exhausted, and there is little reason to hope for further discoveries that would lead to a revival of systematic mining.

Tibet

This mineral has found wide application since remote times in Tibet and other localities in Asia. However, no information is available concerning occurrences. The extensive use of turquoise in this region points to a local supply.

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[10] Ball, S. H., Pharaohs Mined Turquoise in 3200 B.C.: Eng. and Min. Jour., vol. 123, Mar. 19, 1927, pp. 483-485.

[11] Davey, J. C., Notes on the Occurrence and Origin of Turquoise in the Sinai Peninsula: Trans. Royal Geol. Soc. Cornwall, vol. 16, pt. 2, Penzance, 1929, pp. 64-65.

China

Localities in central China have produced considerable turquoise, most of which has been exported to Mongolia and Tibet. Little is known of the occurrences or geology of the deposits in China, but it is thought to come from Hu-Pei Province.

Australia

In Australia turquoise occurs in the States of Victoria, New South Wales, and Queensland. Thus far the Australian deposits have not proved of any great commercial value.

Mexico

In Mexico limited quantities of turquoise have been reported in Sonora and Zacatecas.

South American Countries

Turquoise has been found in Peru and reported in Chile. However, no occurrences of very great importance are accredited to South America. The rather extensive use of turquoise by the tribes that formerly inhabited what is now Peru and Argentina suggests other and more important sources than those generally known. According to Mineral Industry for 1920, a British mineral prospector, Robert Davidson, discovered a rich vein of turquoise in the Cordilleras, near a mine in the Province of San Juan. The samples sent to Buenos Aires were pronounced by an expert to be fine turquoise and worth about 7 pesos per gram. The vein traverses a basaltic formation. This is declared to be the first time that turquoise has been found in Argentina.

MARKETS AND PRICES

In recent years turquoise has been out of fashion in the United States; consequently, the value is down so that good-quality stones weighing not more than a few carats are worth only about $10 a carat. Larger stones of the finest grade are worth more per carat, and inferior stones less. Turquoise matrix stones bring up to $1 a carat, according to quality, but frequently are sold without specific reference to weight, being priced 50 cents to $5 each. In Europe a good-quality turquoise might be worth $12.50 a carat and larger stones even more.

It is said that due to extremes in quality the weight of a turquoise does not properly enter as a factor in its price, because one stone may be worth 10 times as much as another of equal weight. The value of turquoise varies so very much, not only among different peoples but from time to time in the same market, that it is almost impossible to appraise a given specimen. It requires both skill in judging quality and knowledge of market conditions.

The Indians of the southwestern United States value the turquoise more highly than do the whites; and among certain tribes a single string of turquoise beads might be worth several horses. Sales of turquoise to Navaho Indians may be made at a greater profit than could be realized if the stones were sold to regular gem dealers. Likewise in Persia, the home of the turquoise, good prices can often be obtained. Small stones of ordinary quality may be purchased very cheaply in the bazaars,[12] averaging (1928) perhaps one or two krans (about 10 to 20 cents in United States currency), but finer stones bring up to 25 tomans ($25). In Tibet and China, on the other hand, the turquoise does not command as high a price as in other parts of the world.

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[12] Villard, Henry S. (Am. V. C. Teheran, Persia), Turquoise Production in Persia: U. S. Bur. For. and Dom. Commerce, Foreign Trade Notes 235, 1930, p. 3.

Original from THE OHIO STATE UNIVERSITY

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